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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,397	09/16/2003	Minoru Usui	Q77369	1476

23373 7590 02/21/2006  
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EXAMINER
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WEST, PAUL M

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 02/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/662,397

Applicant(s)

USUI ET AL.

Examiner

Paul M. West

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20-34 and 45-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23 and 28-34 is/are allowed.
- 6) ☒ Claim(s) 20-22 and 45-51 is/are rejected.
- 7) ☒ Claim(s) 24-27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20-22 and 46-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfeiffer in view of Murata et al. (hereinafter Murata).

3. As to claims 20 and 48-50, Pfeiffer teaches a detection control circuit for detecting a consumption status of liquid in a container by a detection device having a piezoelectric element 31, the detection device comprising an actually vibrating part 31,24, the circuit comprising: a measurement circuit segment 40 for measuring a residual vibration of the detection device; and a detection circuit segment 15 receiving a signal from the measurement circuit segment 40 and outputting a signal indicative of the consumption status of the liquid contained in the liquid container on the basis of the output signal or the measurement circuit segment. Pfeiffer does not teach the vibrating part facing a cavity. Murata teaches a level detecting device for a container in which a vibrating part 12 faces a cavity which defines the vibration of the contents of the container, wherein the cavity has a depth that is less than  $1/3$  the width and therefore also has a radius-to-depth ratio greater than  $3\pi/8$ . It would have been obvious to one of ordinary skill in the art to use a cavity as taught by Murata with the apparatus of Pfeiffer

because doing so would provide for greater transmittance of vibration to the inside of the container which would lead to more accurate and precise measurements.

4. As to claims 21 and 22, Pfeiffer teaches the measurement circuit segment 40 measuring a frequency of the residual vibration of the detection device and a resonance frequency of the liquid surrounding the detection device (Col. 5, lines 24-26).

5. As to claim 46, the combination of Pfeiffer and Murata does not specifically teach a node of the vibration of the detection device being located on the periphery of a cavity, however Pfeiffer does teach a node of the vibration of the detection device 31 being located on the periphery of the detection area 24. It would have been obvious to one of ordinary skill in the art to locate the node in the periphery of the cavity in the combination of Pfeiffer and Murata because it would permit rigid biasing of vibration excitations necessary for the vibration stimulation.

6. As to claim 47, Pfeiffer teaches part of the vibrating part 24 contacting the liquid in the container.

7. As to claim 51, Pfeiffer teaches the detection device comprising a base member 20,25, wherein the compliance of the vibrating part 24 is greater than that of the base member 20,25 (Col. 2, lines 1-4; Col. 4, lines 21-25).

8. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pfeiffer in view of Murata and further in view of Wimmer et al. (hereinafter Wimmer).

9. As to claim 45, Pfeiffer does not teach the liquid container being an ink cartridge for an inkjet printer. Wimmer teaches a vibratory liquid level sensor where the liquid

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container is an ink cartridge for an inkjet printer (Col. 3, lines 63-65). It would have been obvious to one of ordinary skill in the art to use the apparatus of Pfeiffer to measure the level of ink in an ink cartridge of an inkjet printer because it is useful to know the level of ink in an ink cartridge to facilitate more efficient operation and replacement of empty ink cartridges.

### ***Allowable Subject Matter***

10. Claims 23 and 28-34 are allowed.
11. Claims 24-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

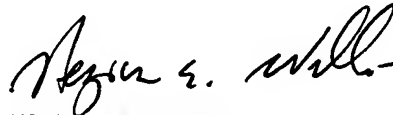
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul M. West whose telephone number is (571) 272-8590. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Hezron Williams", with a long horizontal line extending to the right.

HEZRON WILLIAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800